

NUMBER NINETY-THREE

## 'TRADER' SERVICE SHEETS

## ALBA 220

## 3-VALVE BATTERY MODEL

A 3-VALVE battery-operated chassis is fitted in the Alba 220 receiver, the circuit consisting of a variable-mu pentode H.F. amplifier, an H.F. pentode detector and a pentode output stage. Band-pass tuning, automatic grid bias and sockets for a gramophone pick-up are provided.

## CIRCUIT DESCRIPTION

Aerial input via coupling coils L1, L2, to mixed-coupled band-pass filter. Primary L3, L4 tuned by C11; secondary L5, L6 tuned by C13; capacitative coupling by C1.

First valve (V1, Mullard metallised VP2) is a variable-mu pentode operating as H.F. amplifier. Gain control by variable potentiometer R7 which varies G.B. applied.

Tuned-secondary transformer coupling by L7, L9, L10, C16 to H.F. pentode detector (V2, Mullard metallised SP2) which operates on grid leak system with C4 and R2. Reaction is applied from anode by coil L8 and controlled by variable condenser C15. Provision for connection of gramophone pick-up in grid circuit by switch S7. Switch S9 breaks V1 filament circuit on gram. and thus prevents radio break-through.

Parallel fed transformer coupling by R4, C8 and T1 to output pentode (V3, Mullard PM22A). Tone correction by fixed condenser C10.

G.B. for V1 and V3 is obtained automatically from the voltage drop

along resistances R5 and R6 in common H.T. negative line.

## COMPONENTS AND VALUES

	Resistances	Values (ohms)
R1	V1 cont. grid resistance	2,000,000
R2	V2 grid leak	2,000,000
R3	V2 S.G. H.T. feed	250,000
R4	V2 anode load	100,000
R5	Automatic G.B. resistances	400
R6		1,000
R7	V1 gain control	25,000

	Condensers	Values ( $\mu$ F)
C1	Band-pass capacitative coupling	0.02
C2	V1 cont. grid condenser	0.0001
C3	H.F. trans. capacitative coupling	0.00005
C4	V2 grid condenser	0.0001
C5	V2 S.G. by-pass	0.1
C6	V2 anode H.F. by-pass	0.0001
C7*	H.T. reservoir	2.0
C8	L.F. coupling to Tr	0.25
C9*	Auto G.B. resistors by pass	25.0
C10	Tone corrector	0.01
C11+	Band-pass primary tuning	—
C12+	Band-pass primary trimmer	—
C13+	Band-pass secondary tuning	—
C14+	Band-pass secondary trimmer	—
C15+	Reaction control	0.0005
C16+	H.F. transformer tuning	—
C17+	H.F. transformer trimmer	—
C18	Band-pass primary L.W. trimmer	Very low

\*Electrolytic      † Variable      ‡ Pre-set

## Other Components

Approx.  
Values  
(ohms)

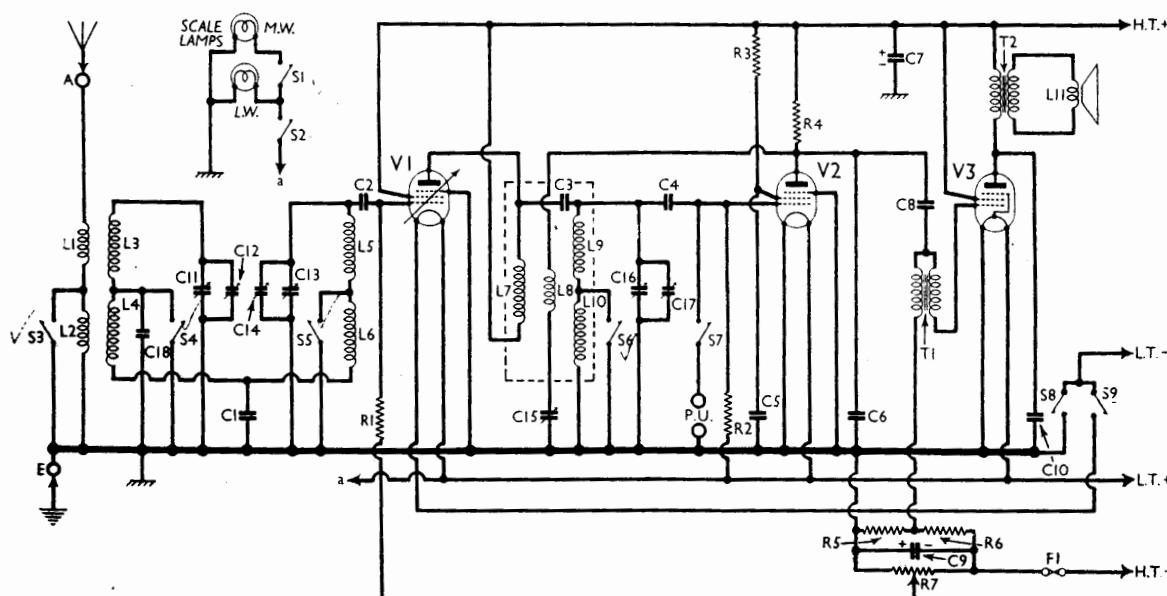
L1	Aerial coupling coils ..	10.0
L2	Band-pass primary coils ..	40.0
L3	Band-pass secondary coils ..	3.5
L4	H.F. transformer primary ..	11.0
L5	Reaction coil ..	3.5
L6	H.F. transformer secondary ..	150.0
L7	Speaker speech coil ..	6.0
L8	Intervalve trans. { Pri. ..	1.2
L9	Sec. ..	900.0
L10	Speaker input trans. { Pri. ..	1,800.0
L11	Sec. ..	700.0
T1	M.W. scale lamp switch ..	—
T2	"Searchlight" master switch ..	—
S1	Waveband switches ..	—
S2	Gram. pick-up switch ..	—
S3-S6	V2, V3 L.T. switch ..	—
S7	V1 L.T. switch ..	—
S8	H.T. circuit fuse ..	—
S9		—
F1		—

## DISMANTLING THE SET

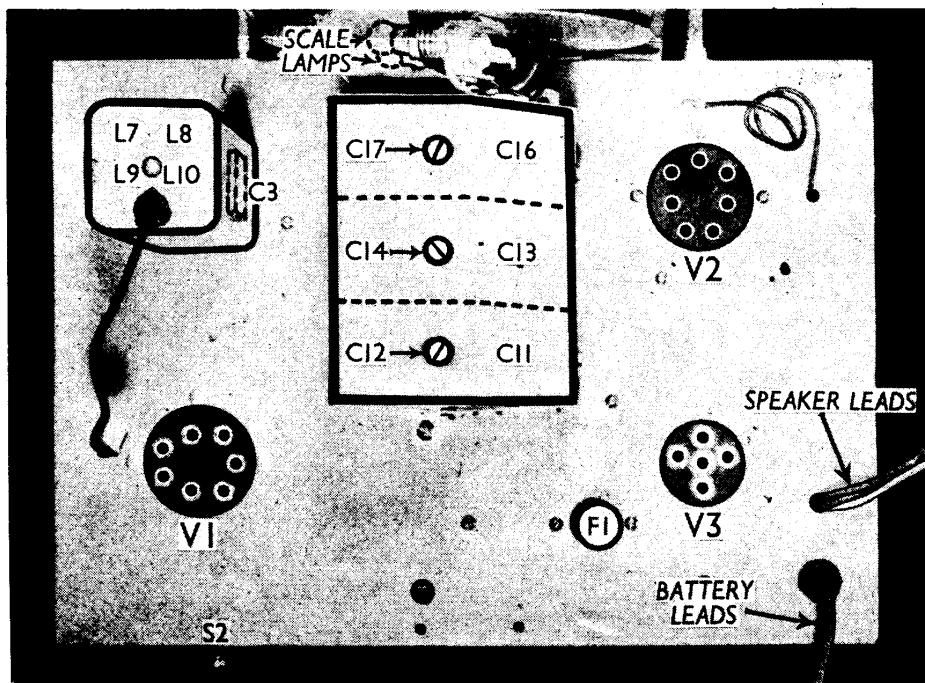
**Removing Chassis.**—If it is necessary to remove the chassis from the cabinet, remove the four control knobs (recessed grub screws) and the four bolts (with washers) holding the chassis to the bottom of the cabinet. The chassis can now be withdrawn to the extent of the speaker leads, which is sufficient for normal purposes.

*When replacing the chassis,* do not forget the rubber washers between the chassis and the bottom of the cabinet and note that the control knobs are marked, so that it is necessary to see that they are replaced on the correct spindle.

To free the chassis entirely, unsolder the leads to the speaker transformer and free the earthing lead to the frame. *When replacing,* connect the black and white leads to the speaker input transformer and the blue lead to the frame.



Circuit diagram of the Alba 220 3-valve battery receiver. Note the separate switch, S9, for the V1 filament circuit, and also the scale lamp master switch, S2. Automatic bias for V1 and V3 is incorporated, and no G.B. battery is used.



Plan view of the chassis. C3 is inside the L7-L10 coil unit. FI is a screw-type fuse bulb. S2 is the master switch controlling the scale lamps, for L.T. economy.

**Removing Speaker.**—To remove the speaker, remove the two countersunk-head wood screws and the four screws with ornamental heads (with nuts) holding the sub-baffle to the front of the cabinet. The speaker can be removed from the sub-baffle by removing the four screws (with nuts and spring washers).

#### VALVE ANALYSIS

Readings of valve voltages and currents given in the table below were taken with the receiver operating from new batteries, the H.T. reading 128 V. The reaction control was at minimum but the volume control was at maximum. There was no signal input.

Voltages were measured on the 1,200 V scale of an Avometer, using chassis as negative.

Valve	Anode Volts	Anode Current (mA)	Screen Volts	Screen Current (mA)
V1 VP2 ..	110	2.2	110	0.6
V2 SP2 ..	35	0.6	40	0.2
V3 PM22A ..	105	4.5	110	1.3

#### GENERAL NOTES

**Switches.**—S1 and S3-S9 are ganged in a single unit beneath the chassis, and

Switch	M.W.	L.W.	Gram.
S1	C	O	C
S3	C	O	C
S4	C	O	C
S5	C	O	C
S6	C	O	O
S7	O	O	C
S8	C	C	C
S9	C	C	O

are shown in our under-chassis view. Note that S4 and S5, and S8 and S9, each have one common contact. Some of the contacts on the switch unit are blank. The table (col. 1) gives the switch positions for the various control settings, O indicating open, and C, closed.

S2, the scale lamp master switch, is used to reduce the L.T. consumption when not actually tuning the set. It is a Q.M.B. toggle type, mounted at the

rear of the chassis, and is closed when the knob is pushed down.

**Coils.**—L1-L6 are in a single unscreened unit beneath the chassis, and the individual coils are indicated in our under-chassis view. L7-L10 are in a screened unit on the chassis deck, and the unit also contains C3.

**Scale Lamps.**—These are two Osram M.E.S. types, rated at 2.5 V, 0.2 A. The lower one is alight whenever the set is switched on, providing that S2 is closed, the upper one lighting up only when the switch is in the M.W. or Gram. position.

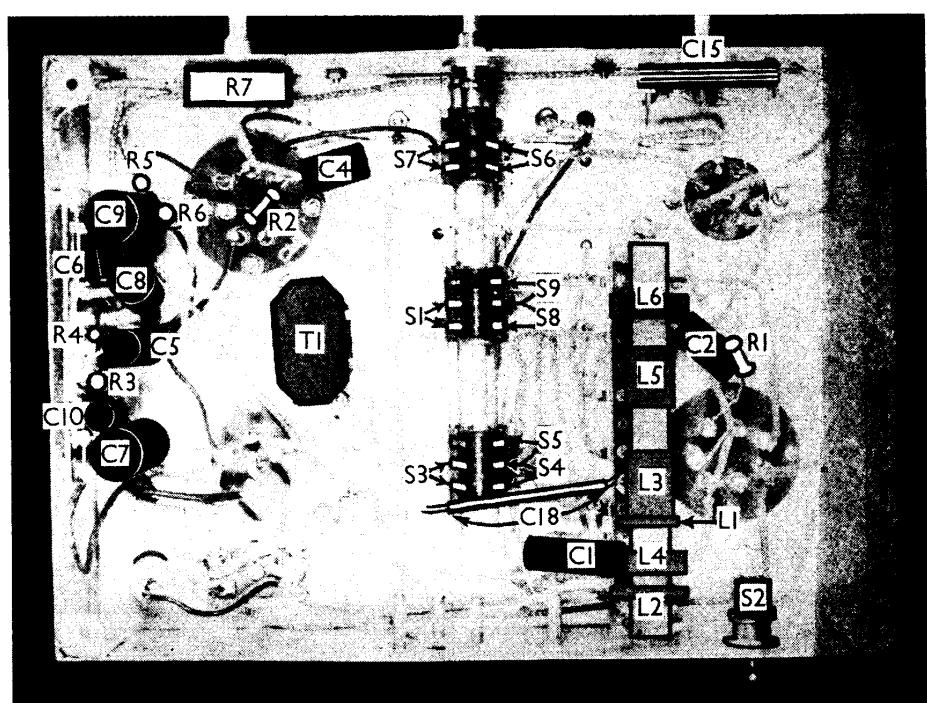
**Fuse Bulb FI.**—This is an M.E.S. Competa type, rated at 0.15 A.

**External Speaker.**—There are no terminals or sockets provided for this in our receiver, although the instruction book states that there are terminals on the speaker transformer. Actually, it is possible to solder leads to the two tags to which the black and white leads from the chassis are connected. In this case a high resistance external speaker must be used.

**Battery Leads and Voltages.**—Black lead with tag, L.T.—; Red lead with tag, L.T.+2 V; Blue lead with black plug, H.T.—; Orange lead with red plug, H.T.+120 V.

**Batteries.**—The batteries supplied are: L.T., 2 V 45 A.H. Economic glass-cased mass-type cell; H.T., Drydex Yellow-Triangle, 120 V, type S34.

**Condenser C18.**—This is a fixed trimmer, formed of a bare wire wound over an insulated wire, the whole being covered with sleeving.



Under-chassis view. The unscreened L1-L6 coil unit is clearly indicated. C18 is a small fixed condenser formed of one wire wound over another insulated one. Certain of the switch contacts are blank, while two of the pairs of switches each have one common contact.